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EXAMINER	
DSOUZA, JOSEPH FRANCIS A	
ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/754,001	CARSON, LANSING MCLAIN	
	Examiner	Art Unit	
	Adolf DSouza	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *30* is/are allowed.

6)☒ Claim(s) *1 - 8, 10 -11,13, 18 - 20, 24 - 25, 28 - 29* is/are rejected.

7)☒ Claim(s) *9, 12, 14 - 17, 21 - 23, 26 - 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20070413*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Specification

1. The disclosure is objected to because of the following informalities:

- In the specification (page 11, paragraph 51, 1st line), "narrowban" should be corrected to "narrowband".
- In the specification (page 15, 2nd line), "?the" should be corrected "the".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 2, 10, 11, 18 – 20, 25, 28 - 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent (US 5,831,977) in view of Yang (US 6.598,009) and further in view of Agee et al. (US 6,359,923).

Regarding claim 1, Dent discloses a system for the reception and despreading of a direct-sequence spread-spectrum (DSSS) signal (Title; column 17, lines 38 – 45), said system comprising:

an antenna array configured to receive said DSSS signal and comprising a plurality of antenna elements (Figs. 3 & 5 inputs; Abstract; column 3, lines 51 – 56; column 4, lines 26 – 34);

a time-to-frequency-domain (TFD) transformer coupled to said preprocessor and configured to transform said TD DSSS signal stream from the time domain to the frequency domain to produce a frequency-domain (FD) DSSS signal stream (Fig. 5, element 80; column 14, lines 19 – 27);

a beam former coupled to said TFD transformer, configured to form a reception beam in said DSSS signal, and configured to produce a beamed signal stream in the frequency domain from said FD DSSS signal stream (Fig. 5, element 81, 82; column 14, lines 38 – 51; wherein the frequency transformed signal from element 80 is weighted by the amplitude shaping circuit 81 and phasing unit 82) ;

and a frequency-to-time-domain (FTD) transformer coupled to said despreader and configured to transform said FD despread signal stream from the frequency domain to the time domain to produce a received signal stream (Fig. 5, element 82; column 14, lines 47 – 51).

Dent does not explicitly disclose a preprocessor and a despreader, which is in the frequency domain. (Dent mentions preprocessing briefly (column 4, lines 31 – 34).

In the same field of endeavor, Yang discloses a preprocessor coupled to said antenna array and configured to preprocess said DSSS signal in the time domain to produce a

time-domain (TD) DSSS signal stream (Fig. 1, element 12; Fig. 2; column 7, lines 19 - 45).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Yang, in the system of Dent because this would allow reception of signals on multiple antennas and then down converting them to an IF frequency so that they can sampled and then processed digitally, as disclosed by Yang.

In the same field of endeavor, Agee discloses a despreader coupled to said beam former and configured to despread said beamed signal stream in the frequency domain to produce an FD despread signal stream (Fig. 73, elements 410, 415; column 65, lines 39 – 43 column 66, lines 10 – 20; wherein the conversion of the signal to the frequency domain is done by the FFT in demodulator 410 and the despreading is done by element 415 on a signal that is still in the frequency domain).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Agee, in the system of Dent because this would allow for beamforming and despreading, as disclosed by Agee.

Regarding claim 2, Dent discloses DSSS signal is a code-division multiple access signal (Title; column 17, lines 38 – 45).

Dent does not disclose a GPS system.

In the same field of endeavor, Yang discloses a global positioning system signal (Title, Abstract).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Yang, in the system of Dent because this would allow for beamforming, as disclosed by Yang (Abstract).

Regarding claim 10, Dent discloses the system additionally comprises a coefficient generator configured to provide a coefficient stream (Fig. 5, element 81; column 14, lines 38 - 46);

and said beam former is coupled to said TFD transformer and said coefficient generator and is configured to produce said beamed signal stream from said FD DSSS signal stream in response to said coefficient stream (Fig. 5, elements 80, 81, 82; column 14, lines 19 - 51).

Regarding claim 11, Dent discloses the coefficient generator comprises a memory configured to buffer beam coefficients for said reception beam to produce said coefficient stream (Fig. 5, element 81; wherein the memory is interpreted as being used to store the amplitude shaping coefficients).

Regarding claim 18, Dent discloses the FDT transformer produces a TD despread signal stream (Fig. 5, element 82; column 47 – 51).

Dent does not disclose a post processor.

In the same field of endeavor, Yang discloses said system additionally comprises a postprocessor coupled to said FDT transformer and configured to postprocess said TD despread signal stream in the time domain to produce said received signal stream (Fig. 1, element 42; column 6, lines 50 – 54; wherein the post processor is interpreted as element 42 which obtains an input from the output of element 30).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Yang, in the system of Dent because this would allow for Doppler removal, as disclosed by Yang.

Regarding claim 19, Dent does not disclose a Doppler compensator.

In the same field of endeavor, Yang discloses the postprocessor comprises a doppler compensator configured to effect doppler compensation of said TD despread signal stream in the time domain to produce said received signal stream (Fig. 1, element 42; column 6, lines 50 – 54).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Yang, in the system of Dent because this would allow for Doppler removal, as disclosed by Yang.

Regarding claim 25, Dent does not disclose mixing the beam coefficients with the filter coefficients.

In the same field of endeavor, Agee discloses mixing said beam coefficients with filter coefficients for said reception beam to form said coefficient stream (column 59, lines 43

– 50; column 66, lines 13 – 17; wherein mixing the beam coefficients and the filter coefficients is interpreted as applying the beamforming and code nulling weights).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Agee, in the system of Dent because this would allow for beamforming and interference rejection, as disclosed by Agee.

Claims 20, 28, 29 are directed to method/steps of the same subject matter claimed in apparatus claims 1, 18, 19 respectively and therefore, are rejected as explained in the rejections of claims 20, 28, 29 above.

4. Claims 3, 7, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent (US 5,831,977) in view of Yang (US 6.598,009) and further in view of Agee et al. (US 6,359,923) and Martin et al. (US 5,214,768).

Regarding claim 3, Dent discloses reception of a DSSS signal (Title; column 17, lines 38 – 45).

Dent does not disclose a digitizer coupled to an antenna element and a memory.

In the same field of endeavor, Yang discloses each of said antenna elements is configured to receive said elemental signal (Fig. 1, element 12; Fig. 2, antenna elements 14; column 6, lines 22 - 27) ;

and for one of said antenna elements, said preprocessor comprises: a digitizer coupled to said one antenna element and configured to down convert and digitize said elemental signal received by said one antenna element into an adjusted signal (Fig. 2, elements 14 to end of chain 112, especially mixer 102 to the down conversion and ADC 112 to do the digitization and the adjusted signal is interpreted as the down converted and digitized signal).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Yang, in the system of Dent because this would allow reception of signals on multiple antennas and then down converting them to an IF frequency so that they can sampled and then processed digitally, as disclosed by Yang.

Dent does not disclose a memory for storing the output after digitization.

In the same field of endeavor, Martin discloses a memory coupled to said digitizer and configured to produce a portion of said signal stream from said adjusted signal (column 17, lines 9 – 17; column 25, lines 25 – 30; wherein the memory is the multi-access memory).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the memory, as taught by Martin in the system of Dent, as this would allow storage of the digitized data, as is well known in the art.

Regarding claim 7, the multi-access memory is as analyzed above in claim 3.

Regarding claim 8, Dent does not disclose a ping-pong memory.

In the same field of endeavor, Martin discloses multi-access memory comprises a plurality of ping-pong random-access memories (column 14, lines 12 - 22).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the ping-pong memory, as taught by Martin in the system of Dent, as this would allow simultaneous reads and writes, as disclosed by Martin.

5. Claims 4, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent (US 5,831,977) in view of Yang (US 6.598,009) and further in view of Agee et al. (US 6,359,923), Martin et al. (US 5,214,768) and Chalmers (US 5,375,146).

Regarding claim 4, Dent discloses reception of a DSSS signal (Title; column 17, lines 38 – 45).

Dent does not disclose an analog to digital converter and a digital down converter.

In the same field of endeavor, Yang discloses the digitizer comprises: an analog-to-digital (A/D) converter coupled to said one antenna element and configured to convert said DSSS elemental signal into a DSSS digitized signal (Fig. 2, element 112; column 7, lines 19 - 25).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the analog-to-digital (A/D) converter, as taught by Yang to digitize the data, as is well known in the art.

Dent does not disclose a digital down converter.

In the same field of endeavor, Chalmers discloses a digital down converter coupled to said A/D converter and configured to down convert said digitized signal into said adjusted signal (Fig. 15, elements 1560, 1550; 1570; column 16, line 40 – column 17, line 9).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Chalmers in the system of Dent, to digitize the data and down digitally down convert to baseband, as this would enable the advantages of digital circuitry (no variation in analog components) to be utilized, as is well known in the art.

Regarding claim 6, Dent discloses reception of a DSSS signal (Title; column 17, lines 38 – 45).

Dent does not disclose an analog down converter and an A/D converter coupled to the analog down converter.

In the same field of endeavor, Chalmers discloses the digitizer additionally comprises an analog down converter coupled to said one antenna element and configured to down

convert said elemental signal into a converted signal (Fig. 15, element 1520, column 16, line 41 – column 17, line 9);

and said A/D converter is coupled to said analog down converter and configured to convert said DSSS converted signal into said DSSS digitized signal (Fig. 15, element 1550, column 16, line 41 – column 17, line 9).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Chalmers in the system of Dent, as this would enable the down conversion and digitization of the received signal, as is well known in the art.

In the same field of endeavor, Yang discloses an analog down converter coupled to said one antenna element (Fig. 2, element 14, 102; wherein the analog down converter is the mixer coupled to the antenna element 14).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Yang, in the system of Dent because this would allow the received signal to be down converted, as is well known in the art.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dent (US 5,831,977) in view of Yang (US 6.598,009) and further in view of Agee et al. (US

6,359,923), Martin et al. (US 5,214,768), Chalmers (US 5,375,146) and Applicant Admitted Prior Art (hereafter referred to as AAPA).

Regarding claim 5, Dent discloses reception of a DSSS signal (Title; column 17, lines 38 – 45).

Dent does not disclose a digital down converter and a presummer.

In the same field of endeavor, Chalmers discloses a digital down converter converts said digitized signal into a baseband signal (Fig. 15, elements 1560, 1550; 1570; column 16, line 40 – column 17, line 9).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Chalmers to digitize the data and down digitally down convert to baseband, as this would enable the advantages of digital circuitry (no variation in analog components) to be utilized, as is well known in the art.

In the same field of endeavor, AAPA discloses the digitizer additionally comprises a presummer coupled to said digital down converter and configured to produce said DSSS adjusted signal from said DSSS baseband signal (Applicant's specification, page 8, paragraph 39; wherein the Applicant has admitted that the presummer and degree of presuming is well known in the art).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by AAPA in the system of Dent,

as this would allow the baseband signal being segmented ad displaced in time, as disclosed by AAPA.

7. Claims 13, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent (US 5,831,977) in view of Yang (US 6.598,009) and further in view of Agee et al. (US 6,359,923) and Applebaum (US 5,510,796).

Regarding claim 13, Dent discloses a TFD transformer (Fig. 5, element 80).

Dent does not explicitly disclose a multiplier and an accumulative adder used in the beam former.

In the same field of endeavor, Applebaum discloses a multiplier coupled to said TFD transformer and said coefficient generator, and configured to combine said FD DSSS signal stream with said coefficient stream to produce a plurality of partial-beam signal streams (Fig. 2, weight generator 23, multipliers $w_{2,1}$ ... $w_{2,N}$; wherein the partial beam signal are interpreted as the output of the weights and the input is interpreted as being obtained from the FFT in Dent);

and an accumulative adder coupled to said multiplier and configured to sum said plurality of partial-beam signal streams to produce said beamed signal stream (Fig. 2, element "vector adder").

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Applebaum in the system of Dent, as this would allow the beam forming signal to be generated, as disclosed by Dent.

Regarding claim 24, Dent discloses a DSSS signal (Title; column 17, lines 38 – 45) and generating a coefficient stream comprising beam coefficients for said reception beam (Fig. 5, element 81; wherein the coefficient stream are the coefficients $c_1 \ldots c_N$) and mixing said FD DSSS signal stream and said coefficient stream to form a plurality of partial-beam signal streams (Fig. 5, output of element 81)

Dent does not disclose explicitly disclose accumulating the partial beam signals.

In the same field of endeavor, Applebaum discloses accumulatively summing each of said plurality of partial-beam signal streams to produce a plurality of beamed signal streams (Fig. 2, element "vector adder").

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Applebaum in the system of Dent, as this would allow the beam forming signal to be generated, as disclosed by Dent.

Allowable Subject Matter

8. Claims 9, 12, 14 – 17, 21 – 23, 26 – 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 30 is allowed.

Other Prior Art Cited

9. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents are cited to further show the state of the art with respect to beam forming and/or despreading in CDMA systems:

Matusoka et al. (US 6,061,553) discloses an adaptive antenna system using beam forming.

Enegeler (US 5,477,859) discloses a ultrasound imaging system having spatial filtering preprocessor that uses a transform beam former.

Dent (US 5,894,473) discloses a Multiple access communications system and method using code and time division that uses beam forming.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adolf DSouza whose telephone number is 571-272-1043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Adolf DSouza
Examiner
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AD

David C. Payne
DAVID C. PAYNE
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